

We Claim:

1. A fastener comprising
a fastener body sized and configured for
deployment in tissue and including a region for
penetrating tissue in response to a force, and
an attachment element carried by the fastener
body sized and configured to couple to an attachment site
on a prosthesis.
2. A fastener according to claim 1
wherein the fastener body comprises a distal
end that includes the region for penetrating tissue and
proximal end for releasably coupling the fastener body to
a force applier, and
wherein the proximal end carries the
attachment element.
3. A fastener according to claim 2
wherein the proximal end includes a stop
structure to prevent over-penetration of the fastener
body into tissue so that the attachment element is
exposed for use.
4. A fastener according to claim 1
wherein the region for penetrating tissue
comprises a helical coil.
5. A fastener according to claim 1
wherein the fastener body comprises a stent
ring having an outer surface that includes the region for
penetrating tissue.
6. A fastener according to claim 5
wherein the stent ring is expandable between a
radially constrained condition and a radially expanded
condition.
7. A fastener according to claim 5
wherein the fastener body includes an interior
surface that includes the attachment element.
8. A fastener according to claim 5

wherein the region for penetrating tissue includes a tissue penetrating element.

9. A fastener according to claim 1 wherein the attachment element comprises a mechanical coupling assembly.

10. A fastener according to claim 9 wherein the mechanical coupling assembly includes a hook.

11. A fastener according to claim 9 wherein the mechanical coupling assembly includes a barb.

12. A fastener according to claim 1 wherein the attachment element comprises a magnetic coupling assembly.

13. A fastener according to claim 1 wherein the attachment element comprises a chemical coupling assembly.

14. A fastener according to claim 1 wherein the fastener body includes a radio-opaque marker material.

15. A prosthesis system comprising cooperating first and second attachment elements,

a prosthesis that carries one of the attachment elements, and

a fastener body sized and configured for deployment in tissue and including a region that carries the other one of the attachment elements to couple the prosthesis to the fastener body.

16. A system according to claim 15 wherein the cooperating attachment elements comprise a mechanical coupling assembly.

17. A system according to claim 16 wherein the mechanical coupling assembly includes a hook.

18. A system according to claim 16
wherein the mechanical coupling assembly
includes a barb.

5 19. A system according to claim 15
wherein the cooperating attachment elements
includes a magnetic coupling assembly.

20. A system according to claim 15
wherein the cooperating attachment elements
includes a chemical coupling assembly.

10 21. A system according to claim 15
wherein the fastener body comprises a distal
end that includes a region for penetrating tissue and
proximal end for releasably coupling the fastener body to
a force applier, and

15 wherein the proximal end carries the other one
of the attachment elements.

22. A system according to claim 21
wherein the proximal end includes a stop
structure to prevent over-penetration of the fastener
20 body into tissue so that the other one of the attachment
elements is exposed for coupling to the attachment
element carried by the prosthesis.

23. A system according to claim 21
wherein the region for penetrating tissue
25 comprises a helical coil.

24. A system according to claim 15
wherein the fastener body comprises a stent
ring having an outer surface that includes a region for
penetrating tissue.

30 25. A system according to claim 24
wherein the stent ring is expandable between a
radially constrained condition and a radially expanded
condition.

35 26. A system according to claim 24
wherein the fastener body includes an interior

surface that includes the one attachment element.

27. A system according to claim 24
wherein the region for penetrating tissue
includes a tissue penetrating element.

5 28. A system according to claim 15
wherein the fastener body includes a radio-
opaque marker material.

29. A method for securing a prosthesis to
tissue in a targeted tissue region comprising the steps
10 of:

(i) introducing at least one fastener into the
targeted tissue region;

(ii) implanting the fastener in tissue in the
targeted tissue region;

15 (iii) after steps (i) and (ii), introducing a
prosthesis into the targeted tissue region, and

(iv) attaching the prosthesis to the fastener
to secure the prosthesis to tissue in the targeted tissue
region.

20 30. A method according to claim 27
wherein the fastener comprises a helical coil
having a proximal end attaches to the prosthesis during
step (iv).

31. A method according to claim 27
25 wherein the fastener comprises a stent ring
having an outer surface that includes a region for
penetrating tissue and an inner surface that attaches to
the prosthesis during step (iv).

32. A method for securing a prosthesis to
30 tissue in a targeted tissue region comprising the steps
of:

(i) introducing a prosthesis into the
targeted tissue region;

35 (ii) placing the prosthesis into contact with
tissue in the targeted tissue region;

(iii) after steps (i) and (ii), introducing at least one stent ring into the targeted tissue region; and

(iv) pressing an outer surface of the stent ring against the prosthesis to secure the prosthesis to
5 tissue within the targeted tissue region.